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Vangsgaard, Steffen; Nørgaard, Lars Tønners; Madeleine, Pascal; Taylor, Janet L.

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## Crossed responses in human trapezius are not H-reflexes

Steffen Vangsgaard<sup>1</sup> • Lars T. Nørgaard<sup>1</sup> • Pascal Madeleine<sup>1</sup> • Janet L. Taylor<sup>2</sup>

<sup>1</sup>Center for Sensory-Motor Interaction (SMI), Dept. of Health Science and Technology, Aalborg University; <sup>2</sup>Neuroscience Research Australia and the University of New South Wales, Sydney, Australia

**Introduction:** In trapezius, previous findings have described both ipsilateral and unusual crossed H-reflexes. Our study aimed to confirm these findings by investigating the responses evoked in trapezius by stimulation of the C3/4 cervical nerves.

**Methods:**  $M_{\max}$  and  $H_{\max}$  were measured in the ipsilateral trapezius in subjects ( $n=10$ ) by percutaneous electrical stimulation of the accessory nerve and the cervical nerves of C3/4 respectively. Repeated stimulation of the C3/4 cervical nerves was performed during 3 different tasks (relaxation, contraction of ipsilateral side, contraction of contralateral side).

**Results:** Stimulation of the accessory nerve evoked M waves at an average latency of  $2.9 \pm 0.2$  ms for the upper part,  $3.9 \pm 0.5$  ms for the middle part, and  $5.0 \pm 0.7$  ms for the lower part of the ipsilateral trapezius. Stimulation of the C3/4 cervical nerves evoked ipsilateral reflexes in the upper ( $n=8$ ) middle ( $n=9$ ) and in the lower ( $n=7$ ) trapezius with an ipsilateral contraction. The latencies were  $8.9 \pm 0.2$  ms,  $10.0 \pm 0.4$  ms, and  $10.9 \pm 0.4$  ms respectively in the upper, middle, and lower parts of trapezius. These responses increased significantly with an increase in pre-stimulus EMG and decreased significantly with a decrease in pre-stimulus EMG in all ipsilateral parts of trapezius. Thus, they were considered H-reflexes. Contralaterally, responses with latencies corresponding to those observed ipsilaterally occurred in the upper ( $n=1$ ), middle ( $n=9$ ), and lower ( $n=6$ ) part of trapezius. These potentials which were recorded from the left trapezius increased significantly more with contraction of the right trapezius compared with contraction on the left side. Thus, they were considered not to be H-reflexes, but to be far field EMG.

**Conclusion:** This study found ipsilateral and contralateral responses consistent with previous findings. However, we conclude that the contralateral response is not a crossed reflex. Further investigations are required to be able to fully dismiss that crossed reflexes between the two trapezii are present.